

## AN ALASKAN RECORD FOR MOUNTAIN MIDGES (DIPTERA: DEUTEROPHLEBIIDAE) WITH NOTES ON LARVAL HABITAT<sup>1,2</sup>

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**ABSTRACT:** Larvae of *Deuterophlebia* sp. are reported for the first time from Alaska. The larvae were found adhering to quartz boulders in an isolated interior Alaskan muskeg-black spruce associated creek. The preceding winter conditions at the collection area were extremely harsh with water flow restricted at times to movement through the substrate and considerable anchor ice formation.

The family Deuterophlebiidae is represented by a single genus *Deuterophlebia* Edwards, comprised of eight described species, four in North America and four in northern Asia. Distribution of the genus is sporadic with larvae typically restricted to fast-moving mountain streams.

On June 7, 1982, 18 third instar larvae of *Deuterophlebia* were collected from Champion Creek Alaska (142° 08' 00" lat., 64° 33' 10" long.). The locality lies 56 km west 7.5° north from Chicken, Alaska, at an elevation of 600 m. One additional larva was collected in a Surber sample from the Middle Fork of Forty Mile River, 15 km southwest of the Champion Creek site. Both areas are accessible only by long overland trek or by air.

Courtney (1985) determined that, due to the stage of the larvae, positive identification was difficult, but that they are most closely associated with *D. coloradensis* complex larvae. The specimens have been deposited in the James Entomological Collection at Washington State University.

Larvae were found adhering to smooth quartz boulders protruding into the upper layers of the water column in Champion Creek. The predominant components of the substrate were metasedimentary and glacially transported cobble. On 7 June the water course was 30 to 45 cm deep with a velocity of 0.3 to 0.6 m/sec. The water source was primarily snow melt and run-off from muskeg-black spruce bog.

In April 1982 holes were augered through the ice, but no unfrozen water was found. During these times some water flow continues through subsurface layers of gravel. From 44 additional holes augered in frozen creeks within the same drainage system, no unfrozen water was detected.

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Large air spaces were typically found between the ice formed at the fall surface water level and the frozen substrate. Harsh winter creek conditions are responsible for considerable mortality resulting in low spring density of invertebrates (Clifford, 1969). This was likely the cause of the low invertebrate density (6 per standard Surber sample) at Champion Creek on the collection date.

How mountain midges overwinter in this area is unknown as Champion Creek is typically ice bound from October until May and minimum air temperatures may approach  $-50^{\circ}\text{C}$ . It was suggested by Pennak (1951) that larvae of *D. coloradensis* overwinter although whether the water and/or substrate freezes in the area was not reported. Life history studies on *D. nielsoni* by Kennedy (1958) suggest that the eggs are deposited in the summer and overwinter to produce early-state larvae the following spring. This may be the same overwintering strategy used by the Alaskan species to survive extreme winter conditions.

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